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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/965,803	10/01/2001	Kazuhiro Tanaka	401384	3457

23548 7590 02/25/2004

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EXAMINER	
CULBERT, ROBERTS P	

ART UNIT	PAPER NUMBER
1763	

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/965,803	TANAKA, KAZUHIRO	
	Examiner	Art Unit	
	Roberts Culbert	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 February 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *14-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *14-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 2/4/04 have been fully considered but they are not persuasive.

Applicant has argued, "Neither of these rejections can be maintained as to the new claims because neither of Yueh or Yu describes measuring a characteristic of slurry as the slurry is being supplied to the polishing apparatus nor controlling polishing in response to the measured characteristic."

The argument is not persuasive because Yueh describes both measuring a characteristic of slurry as the slurry is being supplied to the polishing apparatus and controlling polishing in response to the measured characteristic. Note that even though used slurry is measured, the used slurry is being supplied to the polishing apparatus. Further, modification of the slurry characteristics is clearly described in Yueh. Polishing is controlled by changes to the slurry characteristics.

Applicant has argued that "The recycled and "freshened" slurry may change in characteristics, e.g., particle size distribution and particle dispersal, between the time of "freshening" and supply to the polishing apparatus. Thus, Yueh cannot anticipate any pending claim.

The argument is not persuasive because nothing in the pending claims suggests that the slurry may not change in characteristics between the time of freshening and supply to the polishing apparatus.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 14, 15, and 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,791,970 to Yueh.

Regarding Claims 14 and 20, Yueh teaches a method of chemical mechanical polishing of an object comprising: supplying a slurry to a polishing apparatus including a polisher and the object to be polished; (Figure 2 and Col. 2, Lines 55-60) measuring particle information, including at least one of dispersion of particles and distribution of particle sizes (Figure 4 and Col. 3, Line 57-Col. 4, Line 20), of the slurry being supplied to the polishing apparatus; and controlling polishing speed and time, based on the particle information. Note that the slurry is supplied to the polishing apparatus (Figure 2) through return conduit (33). Polishing speed and time are both controlled since the wafer removal rate is controlled. (Col. 3, Lines 14-22 and Col 3, Lines 38-44) This rate is polishing speed, which is a function of polishing time.

Regarding Claim 15, Yueh teaches controlling the polishing speed by adjusting a physical variable of the polisher. For example, particle size distribution is considered to be a physical variable of the polisher.

Regarding Claim 17, Yueh teaches supplying a mixture (29) of a first slurry (25) and a second slurry (30) to the polishing apparatus as the slurry.

Regarding Claim 18, Yueh teaches controlling mixing ratio between the first slurry and the second slurry on the particle information. (Col. 3, Lines 8-13)

Regarding Claim 19, Yueh teaches detecting the polishing speed at which the object is polished; and controlling the mixing ratio based on the polishing speed. (Col. 3, Lines 17-22) Note that the instantaneous wafer removal rate is the polishing speed of the object.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,791,970 to Yueh in view of U.S. Patent 6,383,332 to Shelton.

As applied above, Yueh teaches the method of the invention substantially as claimed, but does not teach that the physical variable is at least one of a rotation speed of the polisher, rotation speed of the object, and force applied by the polisher to the object.

Referring to figures 2, and 3, Shelton teaches a method of chemical mechanical polishing (CMP) comprising: supplying a slurry (268), and polishing an object (100) with particles contained in the slurry, including controlling a physical quantity which is a determinant factor of a polishing speed with respect to the object, based on information on the particles contained in the slurry. Note: the information on the particles contained in the slurry is received by controller (280) from sensor (276). The controller (280) adjusts pressure on the polishing pad (282), pad speed (283), plate speed (284), slurry flow (287) etc.

Shelton also teaches a step of controlling polishing time based on information on the particles contained in the slurry. (Col.1, Lines 3-5)

It would have been obvious to one of ordinary skill in the art at the time of invention to control the polishing speed by adjusting a physical variable such as rotation speed of the polisher, rotation speed of the object, or force applied by the polisher to the object.

One of ordinary skill in the art would have been motivated at the time of invention to control the polishing speed in the method of Yueh by adjusting a physical variable such as rotation speed of the polisher, rotation speed of the object, or force applied by the polisher as shown in Shelton since Shelton teaches that adjusting a physical variable such as rotation speed of the polisher, rotation speed of the object, or force applied by the polisher is a suitable method for controlling polishing speed based on information obtained from particles contained within a polishing slurry.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date

of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberts Culbert whose telephone number is (571) 272-1433. The examiner can normally be reached on Monday-Friday (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (571) 272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

R. Culbert

GREGORY MILLS
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